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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/676,883	09/30/2003	Christopher L. Rumer	42P16840	8114

8791 7590 07/28/2005

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EXAMINER

EVERHART, CARIDAD

ART UNIT	PAPER NUMBER
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2891

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/676,883	RUMER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Caridad M. Everhart	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                    |                                                                             |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____                                                 |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>7/30/03</u>                                                               | 6) <input type="checkbox"/> Other: ____                                     |

Art Unit: 2891

Applicant's arguments with respect to claims 1-21 have been considered but are moot in view of the new ground(s) of rejection.

Applicant has amended to include the limitation "including active semiconductor components".

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-4, 7-14, 17-18, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erikson, et al. (US 6,589,180B2).

Erikson, et al discloses a first substrate with through vias(col. 7, lines 10-15). The substrate has active semiconductor devices(col. 11, lines 35-38 describes a switch 156), and have through vias(col. 11, lines 35-44). The electrical paths extend through the substrate as through vias(col. 12, lines 58-65). As shown in Fig. 5, the substrate 20 is coupled to a substrate 10 on one side and coupled to substrate 30 on the other side. It is seen that not only bumps, but underfill labeled 411 in Fig. 1 may be used. The underfill is described as adhesive(col. 8, lines 65-67). Also shown are solder balls 34 in Fig. 1. The bumps or balls are formed of solder(col. 5, lines 1-9). It can be seen that the balls 34 form connections between the two substrates 10 and 40(Fig. 7). The substrates have a part in power distribution and with input or output(col. 11, lines 1-10), as indicated by the disclosure that layer 30 transmits an output signal and is comprised of an amplifier(col. 11, lines 1-10).

Claims 5,15,and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erikson, et al as applied to claim1 above, and further in view of Miyano, et al. (US 5,811,877).

Erikson, et al is silent with respect to the thinning by grinding or etching of the back of the chip.

Miyano, et al discloses the thinning of grinding or etching of the chips in a stacked package in order to prevent cracking(col. 12, lines 47-56; col. 16, lines 63-67; col. 17, lines 1-5 and 31-35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have thinned the chips as taught by Miyano, et al in order to prevent cracking and to obtain a thin package.

Claims 6 , 16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erickson et al as applied to claim 1 above, and further in view of Chau, et al. (US 5,855,821).

Erickson et al is silent with respect to the limitation of the encapsulant including a nonflowable material and with respect to controlled collapse chip connection.

Chau et al discloses controlled collapse chip connection and a dam, which is a nonflowable material for holding in the encapsulant as disclosed by Chau et al, for the encapsulant(col. 1, ines 5-14 and 26-34 and col. 3,lines 4-9).

It would have been obvious to one of ordinary skill in the art at the time of the invention that Erickson et al encompasses the use of controlled collapse chip

Art Unit: 2891

connections because Erickson et al teach bumps as seen in Fig. 5 and Chau et al teach that these connections are desirable for the easier processing of these bumps.

It would have been obvious to one of ordinary skill in the art at the time of invention that Erickson et al encompasses a dam which is a nonflowable material as seen in Fig. 1 or Erickson et al and in the Figure are labeled 420, although not described in the text, they are shown in the Figure, and Chau et al disclose that the dam holds in the encapsulant, which would be desirable in the process taught by Erickson et al.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

Art Unit: 2891

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. Everhart  
7-20-2005

  
CARIDAD EVERHART  
PRIMARY EXAMINER